

Application No. 10/578,737  
Paper Dated: April 4, 2011  
In Reply to USPTO Correspondence of January 4, 2011  
Attorney Docket No. 1455-061439

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims**

1-82. (Canceled).

83. (Currently Amended) A cold rolled steel sheet for an automobile having aging resistance, comprising in weight %: 0.003 % or less of C; 0.005 ~ 0.03 % of S; 0.01 ~ 0.1 % of Al; 0.02 % or less of N; 0.2% or less of P; 0.05 ~ 0.2 % of Mn; 0.2 ~ 1.2% Cr and the balance of Fe and other unavoidable impurities, wherein a composition of Mn and S satisfies the relationship:  $0.58 \times \text{Mn}/\text{S} \leq 10$ , and wherein the steel sheet comprises precipitates of MnS having an average size of 0.2  $\mu\text{m}$  or less, and wherein the steel has a yield strength of 197 MPa or more and an  $r_m$ -value of 1.47 or more.

84. (Canceled).

85. (Previously Presented) The steel sheet as set forth in claim 83, wherein the steel sheet comprises 0.004 % or less of N.

86. (Canceled).

87. (Previously Presented) The steel sheet as set forth in claim 83, further comprising 0.1 ~ 0.8 % of Si.

88. (Previously Presented) The steel sheet as set forth in claim 83, wherein the steel sheet comprises 0.005 ~ 0.02 % of N and 0.03 ~ 0.06 % of P.

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89. (Previously Presented) The steel sheet as set forth in claim 88, wherein the composition of Al and N satisfies the relationship:  $1 \leq 0.52 * \text{Al}/\text{N} \leq 5$ .

90. (Previously Presented) The steel sheet as set forth in claim 83, further comprising 0.01 ~ 0.2 % of Mo.

91. (Previously Presented) The steel sheet as set forth in claim 87, further comprising 0.01 ~ 0.2 % of Mo.

92. (Previously Presented) The steel sheet as set forth in claim 83, further comprising 0.01 ~ 0.2% of V.

93. (Previously Presented) The steel sheet as set forth claim 87, further comprising 0.01 ~ 0.2 % of V.

94. (Previously Presented) The steel sheet as set forth in claim 91, further comprising 0.01 ~ 0.2% of V.

95. (Currently Amended) A cold rolled steel sheet for an automobile having aging resistance, comprising consisting essentially of in weight %: 0.0005 ~ 0.003 % of C; 0.003 ~ 0.025 % of S; 0.01 ~ 0.08 % of Al; 0.02 % or less of N; 0.2 % or less of P; 0.052 ~ 0.2% of Cu; and the balance of Fe and other unavoidable impurities, wherein a composition of Cu and S satisfies the relationship:  $1 \leq 0.5 * \text{Cu}/\text{S} \leq 10$ , and wherein the steel sheet comprises precipitates of CuS having an average size of 0.1 $\mu\text{m}$  or less.

96. (Previously Presented) The steel sheet as set forth in claim 95, wherein the steel sheet comprises 0.015 % or less of P.

97. (Previously Presented) The steel sheet as set forth in claim 95, wherein the steel sheet comprises 0.004 % or less of N.

98. (Previously Presented) The steel sheet as set forth in claim 95, wherein the composition of Cu and S satisfies the relationship:  $1 \leq 0.5 \times \text{Cu}/\text{S} \leq 3$ .

99. (Previously Presented) The steel sheet as set forth in claim 95, wherein the steel sheet comprises 0.03 ~ 0.2 % of P.

100. (Currently Amended) The steel sheet as set forth in claim 95, further comprising ~~at least one of 0.1 ~ 0.8 % of Si and 0.2 ~ 1.2 % of Cr.~~

101. (Previously Presented) The steel sheet as set forth in claim 95, wherein the steel sheet comprises 0.005 ~ 0.02 % of N and 0.03 ~ 0.06 % of P.

102. (Previously Presented) The steel sheet as set forth in claim 101, wherein the composition of Al and N satisfies the relationship:  $1 \leq 0.52 \times \text{Al}/\text{N} \leq 5$ .

103. (Previously Presented) The steel sheet as set forth in claim 95, further comprising 0.01 ~ 0.2 % of Mo.

104. (Previously Presented) The steel sheet as set forth in claim 100, further comprising 0.01 ~ 0.2 % of Mo.

105. (Previously Presented) The steel sheet as set forth in claim 95, further comprising 0.01 ~ 0.2% of V.

106. (Previously Presented) The steel sheet as set forth claim 100, further comprising 0.01 ~ 0.2 % of V.

107. (Previously Presented) The steel sheet as set forth in claim 104, further comprising 0.01 ~ 0.2% of V.

108. (Currently Amended) A cold rolled steel sheet for an automobile having aging resistance, comprising in weight %: 0.0005 ~ 0.003 % of C; 0.003 ~ 0.025 % of S; 0.01 ~ 0.08 % of Al; 0.02 % or less of N; 0.2 % or less of P; 0.03 ~ 0.2 % of Mn; 0.005 ~ 0.2 % of Cu; and the balance of Fe and other unavoidable impurities, wherein a composition of Mn, Cu, and S satisfies the relationship:  $Mn+Cu \leq 0.3$  and  $2 \leq 0.5*(Mn+Cu)/S \leq 20$ , and wherein the steel sheet includes precipitates of MnS, CuS, and (Mn, Cu)S having an average size of 0.2  $\mu m$  or less, the number of precipitates being  $2 \times 10^6$  or more, and wherein the steel sheet has an Aging Index (AI) of 30 MPa or less, and wherein the steel sheet has a yield strength of 162 MPa or more and an  $r_m$ -value of 1.55 or more.

109. (Previously Presented) The steel sheet as set forth in claim 108, wherein the steel sheet comprises 0.015 % or less of P.

110. (Previously Presented) The steel sheet as set forth in claim 108, wherein the steel sheet comprises 0.004 % or less of N.

111. (Canceled).

112. (Previously Presented) The steel sheet as set forth in claim 108, wherein the composition of Mn, Cu and S satisfies the relationship:  $2 \leq 0.5*(Mn+Cu)/S \leq 7$ .

113. (Previously Presented) The steel sheet as set forth in claim 112, wherein the number of precipitates is  $2 \times 10^8$  or more.

114. (Previously Presented) The steel sheet as set forth in claim 112, wherein the steel sheet comprises 0.03 ~ 0.2 % of P.

115. (Previously Presented) The steel sheet as set forth in claim 112, further comprising at least one of 0.1 ~ 0.8 % of Si and 0.2 ~ 1.2 % of Cr.

116. (Previously Presented) The steel sheet as set forth in claim 112, wherein the steel sheet comprises 0.005 ~ 0.02 % of N and 0.03 ~ 0.06 % of P.

117. (Previously Presented) The steel sheet as set forth in claim 116, wherein the composition of Al and N satisfies the relationship:  $1 \leq 0.52 * Al/N \leq 5$ .

118. (Previously Presented) The steel sheet as set forth in claim 108, further comprising 0.01 ~ 0.2 % of Mo.

119. (Previously Presented) The steel sheet as set forth in claim 115, further comprising 0.01 ~ 0.2 % of V.

120. (Previously Presented) The steel sheet as set forth in claim 108, further comprising 0.01 ~ 0.2% of V.

121. (Previously Presented) The steel sheet as set forth claim 115, further comprising 0.01 ~ 0.2 % of V.

122. (Previously Presented) The steel sheet as set forth in claim 118, further comprising 0.01 ~ 0.2% of V.

123. (Withdrawn) A method of manufacturing a cold rolled steel sheet having aging resistance and excellent formability, comprising the steps of: hot-rolling a steel slab with

finish rolling at an  $Ar_3$  transformation temperature or more to provide a hot rolled steel sheet, after reheating the steel slab to a temperature of 1,100°C or more, the steel slab comprising in weight %: 0.003 % or less of C; 0.005 ~ 0.03 % of S; 0.01 ~ 0.1 % of Al; 0.02 % or less of N; 0.2 % or less of P; 0.05 ~ 0.2 % of Mn; and the balance of Fe and other unavoidable impurities, wherein a composition of Mn and S satisfies the relationship:  $0.58 \times Mn/S \leq 10$ ; cooling the steel sheet at a speed of 200°C/min or more; coiling the cooled steel sheet at a temperature of 700°C or less and then cold rolling the steel sheet; and continuous annealing the cold rolled steel sheet so as to obtain a cold rolled steel sheet comprising MnS precipitates having an average size of 0.2  $\mu$ m or less.

124. (Withdrawn) The method as set forth in claim 123, wherein the steel slab comprises 0.015 % or less of P.

125. (Withdrawn) The method as set forth in claim 123, wherein the steel slab comprises 0.004 % or less of N.

126. (Withdrawn) The method as set forth in claim 123, wherein the steel slab comprises 0.03 ~ 0.2 % of P.

127. (Withdrawn) The method as set forth in claim 123, wherein the steel slab further comprises at least one of 0.1 ~ 0.8 % of Si and 0.2 ~ 1.2 % of Cr.

128. (Withdrawn) The method as set forth in claim 123, wherein the steel slab comprises 0.005 ~ 0.02 % of N and 0.03 ~ 0.06 % of P.

129. (Withdrawn) The method as set forth in claim 128, wherein the composition of Al and N satisfies the relationship:  $1 \leq 0.52 \times Al/N \leq 5$ .

130. (Withdrawn) The method as set forth in claim 123, wherein the steel slab further comprises 0.01 ~ 0.2 % of Mo.

131. (Withdrawn) The method as set forth in claim 127, wherein the steel slab further comprises 0.01 ~ 0.2 % of Mo.

132. (Withdrawn) The method as set forth in claim 123, wherein the steel slab further comprises 0.01 ~ 0.2% of V.

133. (Withdrawn) The method as set forth in claim 127, wherein the steel slab further comprises 0.01 ~ 0.2 % of V.

134. (Withdrawn) The method as set forth in claim 131, wherein the steel slab further comprises 0.01 ~ 0.2% of V.

135. (Withdrawn) A method of manufacturing a cold rolled steel sheet having aging resistance and excellent formability, comprising the steps of: hot-rolling a steel slab with finish rolling at an  $Ar_3$  transformation temperature or more to provide a hot rolled steel sheet, after reheating the steel slab to a temperature of 1,100°C or more, the steel slab comprising in weight %: 0.0005 ~ 0.003 % of C; 0.003 ~ 0.025 % of S; 0.01 ~ 0.08 % of Al; 0.02 % or less of N; 0.2 % or less of P; 0.01 ~ 0.2 % of Cu; and the balance of Fe and other unavoidable impurities, wherein a composition of Cu and S satisfies the relationship:  $1 \leq 0.5 * Cu/S \leq 10$ ; cooling the steel sheet at a speed of 300°C/min; coiling the cooled steel sheet at a temperature of 700°C or less and then cold rolling the wound steel sheet; and continuous annealing the cold rolled steel sheet so as to obtain a cold rolled steel sheet comprising CuS precipitates having an average size of 0.2  $\mu m$  or less.

136. (Withdrawn) The method as set forth in claim 135, wherein the steel slab comprises 0.015 % or less of P.

137. (Withdrawn) The method as set forth in claim 135, wherein the steel slab comprises 0.004 % or less of N.

138. (Withdrawn) The method as set forth in claim 135, wherein the composition of Cu and S satisfies the relationship:  $1 \leq 0.5 \times \text{Cu}/\text{S} \leq 3$ .

139. (Withdrawn) The method as set forth in claim 135, wherein the steel slab comprises 0.03 ~ 0.2 % or less of P.

140. (Withdrawn) The method as set forth in claim 135, wherein the steel slab further comprises at least one of 0.1 ~ 0.8 % of Si and 0.2 ~ 1.2 % of Cr.

141. (Withdrawn) The method as set forth in claim 135, wherein the steel slab comprises 0.005 ~ 0.02 % of N and 0.03 ~ 0.06 % of P.

142. (Withdrawn) The method as set forth in claim 141, wherein the composition of Al and N satisfies the relationship:  $1 \leq 0.52 \times \text{Al}/\text{N} \leq 5$ .

143. (Withdrawn) The method as set forth in claim 135, wherein the steel slab further comprises 0.01 ~ 0.2 % of Mo.

144. (Withdrawn) The method as set forth in claim 140, wherein the steel slab further comprises 0.01 ~ 0.2 % of Mo.

145. (Withdrawn) The method as set forth in claim 135, wherein the steel slab further comprises 0.01 ~ 0.2% of V.

146. (Withdrawn) The method as set forth in claim 143, further comprising 0.01 ~ 0.2 % of V.

147. (Withdrawn) The method as set forth in claim 144, wherein the steel slab further comprises 0.01 ~ 0.2% of V.

148. (Withdrawn) A method of manufacturing a cold rolled steel sheet having aging resistance and excellent formability, comprising the steps of: hot-rolling a steel slab with finish rolling at an  $Ar_3$  transformation temperature or more to provide a hot rolled steel sheet, after reheating the steel slab to a temperature of 1,100°C or more, the steel slab comprising in weight %: 0.0005 ~ 0.003 % of C; 0.003 ~ 0.025 % of S; 0.01 ~ 0.08 % of Al; 0.02 % or less of N; 0.2 % or less of P; 0.03 ~ 0.2 % of Mn; 0.005 ~ 0.2 % of Cu; and the balance of Fe and other unavoidable impurities, wherein a composition of Mn, Cu, and S satisfies the relationships:  $Mn+Cu \leq 0.3$  and  $2 \leq 0.5 * (Mn+Cu)/S \leq 20$ ; cooling the steel sheet at a speed of 300°C/min; coiling the cooled steel sheet at a temperature of 700°C or less and then cold rolling the wound steel sheet; and continuous annealing the cold rolled steel sheet so as to obtain a cold rolled steel sheet comprising MnS, CuS, (Mn, Cu)S precipitates having an average size of 0.2  $\mu m$  or less.

149. (Withdrawn) The method as set forth in claim 148, wherein the steel slab comprises 0.015 % or less of P.

150. (Withdrawn) The method as set forth in claim 148, wherein the steel slab comprises 0.004 % or less of N.

151. (Withdrawn) The method as set forth in claim 148, wherein the number of precipitates is  $2 \times 10^6$  or more.

152. (Withdrawn) The method as set forth in claim 148, wherein the composition of Mn, Cu and S satisfies the relationship:  $2 \leq 0.5 * (Mn+Cu)/S \leq 7$ .

153. (Withdrawn) The method as set forth in claim 152, wherein the number of precipitates is  $2 \times 10^8$  or more.

154. (Withdrawn) The method as set forth in claim 148, wherein the steel slab comprises 0.03 ~ 0.2 % or less of P.

155. (Withdrawn) The method as set forth in claim 148, wherein the steel slab further comprises at least one of 0.1 ~ 0.8 % of Si and 0.2 ~ 1.2 % of Cr.

156. (Withdrawn) The method as set forth in claim 148, wherein the steel slab comprises 0.005 ~ 0.02 % of N and 0.03 ~ 0.06 % of P.

157. (Withdrawn) The method as set forth in claim 156, wherein the composition of Al and N satisfies the relationship:  $1 \leq 0.52 * Al/N \leq 5$ .

158. (Withdrawn) The method as set forth in claim 148, wherein the steel slab further comprises 0.01 ~ 0.2 % of Mo.

159. (Withdrawn) The method as set forth in claim 155, wherein the steel slab further comprises 0.01 ~ 0.2 % of Mo.

160. (Withdrawn) The method as set forth in claim 148, wherein the steel slab further comprises 0.01 ~ 0.2% of V.

161. (Withdrawn) The method as set forth claim 155, wherein the steel slab further comprises 0.01 ~ 0.2 % of V.

162. (Withdrawn) The method as set forth in claim 159, wherein the steel slab further comprises 0.01 ~ 0.2% of V.

163. (Previously Presented) The steel sheet as set forth in claim 92, wherein the composition of V and C satisfies the relationship:  $1 \leq 0.25*V/C \leq 20$ .

164. (Previously Presented) The steel sheet as set forth in claim 105, wherein the composition of V and C satisfies the relationship:  $1 \leq 0.25*V/C \leq 20$ .

165. (Previously Presented) The steel sheet as set forth in claim 120, wherein the composition of V and C satisfies the relationship:  $1 \leq 0.25*V/C \leq 20$ .

166. (Withdrawn) The method as set forth in claim 132, wherein the composition of V and C satisfies the relationship:  $1 \leq 0.25*V/C \leq 20$ .

167. (Withdrawn) The method as set forth in claim 145, wherein the composition of V and C satisfies the relationship:  $1 \leq 0.25*V/C \leq 20$ .

168. (Withdrawn) The method as set forth in claim 160, wherein the composition of V and C satisfies the relationship:  $1 \leq 0.25*V/C \leq 20$ .

169. (Previously Presented) The steel sheet as set forth in claim 83, wherein the steel sheet comprises 0.015% or less of P.

170. (Previously Presented) The steel sheet as set forth in claim 83, wherein the steel sheet comprises 0.03 ~ 0.2% of P.